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Beyond the boundaries of academic science and teaching? Medical misinformation: reflections from university practice

Summary

The text refers to the subject of misinformation in medicine based on facultative classes conducted at the Medical University of Gdańsk. The aim of these classes was to familiarise participants with various non-scientific theories in the field of human health, to indicate scientific guidelines in the field of medicine, and to reflect on misinformation in today's society. This topic is important and has practical implications for the education of future healthcare professionals. The author raises the question of whether information about various non-scientific theories in the field of human health should be a mandatory part of the curriculum of various medical fields of study. This would break a certain boundary in academic teaching, but it would be justified by practical considerations.

Keywords: misinformation, Medical University of Gdańsk, medical education

Introduction

It is an undeniable fact that never before in human history has the flow of information been so rapid and access to knowledge so widespread. Important events from distant parts of the world become the subject of general interest at an express pace. At the same time, more and more research centres are striving to make databases related to various projects public, and the resulting scientific texts are often made widely available. In many countries around the world, there is no problem whatsoever with different people using the collections of national and university libraries. This can be symbolised by the so-called "free access". Of course, the Internet, a place where virtually anyone can publish, also plays a significant role in this. Legal practice shows that unreliable, shocking and offensive content appearing there is rarely the subject of court proceedings. Hence the phenomenon of misinformation, which is currently primarily associated with online content. It consists of formulating a message that contains false information, using untrue data or arguments.

As a social phenomenon, misinformation has long been recognised by the scientific community. In the Polish language alone, many publications on this topic have appeared so far. Among

the books published in recent years are works by Anna Mierzyńska (2022), Katarzyna Bąkowicz (2023) and a translation from a foreign language of a text by Sander van der Linden (2024). Numerous scientific articles are also being written. The importance of this issue is demonstrated by the organisation of two scientific conferences on this topic in Gdańsk in 2025 alone. Misinformation was discussed at the Medical University of Gdańsk (Misinformation in medicine "S.H.I.E.L.D. vs Disinfo", 19 September 2025) and at the Museum of the Second World War (Falsifications and myths in history, 17 October 2025). The first meeting was related to the Erasmus+ KA2 project, which ran from October 2022 to September 2025. Its aim is to develop digital skills against misinformation for university students. I would like to mention that the author of this text was not a member of this team, but took an active part in the conference, which resulted in this article.

Scientists not only observe misinformation as a social phenomenon but are also aware that it affects scientific knowledge. It is worth noting that the spread of unscientific information occurs in almost all fields of knowledge, including ecology (no climate change), economics (the introduction of a minimum wage always leads to the destruction of the economy), history (Adolf Hitler has survived the end of the Second World War) and, finally, medicine (the anti-vaccination movement).

Misinformation in medicine and the limits of academic teaching

In this text, I would like to share my reflections on academic teaching in the field of health sciences in relation to misinformation. First of all, it should be pointed out that the dissemination of unreliable medical knowledge has practical consequences for the audience. These often include deterioration in health and even death. This is the price of abandoning scientifically proven treatment or preventive healthcare.

As in other sciences, the problem of misinformation has also been recognised in academic medical teaching (Mian 2020; Suarez-Lledo 2021; Ortega 2023; Peñafiel-Saiz 2024). Agnieszka Zimmermann, in her article on the education of medical personnel published in the previous issue of this journal (*Horizons of Academic Education*), expressed the following opinion: "In the contemporary world, denialism is spreading. Therefore, there is a growing need to equip graduates with the skills to effectively counteract the spread of false information about health and disease" (Zimmermann, 2024, p. 184).

I became interested in the issue of non-scientific theories in the field of human health while teaching at the Medical University of Gdańsk. My contact with the history of medicine and the philosophy of medical sciences as a teacher led me to create facultative (elective) classes, partly concerning misinformation.

In very general terms, it can be said that the development of ideas about the human body and its health consists of two parts. The first is significant breakthroughs and huge discoveries. The second component consists of ideas rejected by the scientific world but popular in certain circles, such as so-called folk medicine or astromedicine, i.e. the belief in the astrological influence of celestial bodies on human health (Paluchowski, 2024).

What belongs to one part and what to the other is determined by the accepted scientific paradigm, which today is based, among other things, on experience and statistics. In medical science,

this set of scientific guidelines has been named Evidence-Based Medicine (Prasad, 2013). The teaching classes I have designed focus on the latter, non-scientific part. This involves crossing several boundaries.

In this case, the subject of educational interest is knowledge about "non-science", which may already be controversial. The question is, of course, whether it is worth teaching such knowledge at university. In my opinion, it most certainly is, because misinformation has been, is, and will continue to be with us. It is worth not only learning about the mechanisms of creating misinformation in medicine, but also discussing specific non-scientific theories in the field of human health. The aim is to prepare participants for future conversations with patients. This is because many non-scientific theories have been with us for decades. Bioresonance appeared in 1977 (Ernst, 2004), unscientific vegetotherapy, a psychotherapeutic method, was first described in 1935, and mesmerism and the associated hypnosis appeared at the end of the 18th century (Ludwig, 1964).

Teaching classes on misinformation in medicine also requires going beyond the boundaries of the usual academic teacher's education. The teacher needs to acquire knowledge in areas such as:

- medical methodology, in order to be able to clearly define the limits of modern science and evaluate a given non-scientific theory,
- sociology, in order to understand the social determinants of misinformation,
- history, which provides a broader view of the development of medicine.

This approach highlights the interdisciplinary nature of the issue. It would seem that the best candidate to teach such a subject would be someone educated in medicine. I do not deny this, but based on my teaching and research experience, I conclude that many such people, who are also researchers, while discrediting non-scientific theories (rightly so, of course!), at the same time downplay the problem of their functioning in contemporary societies. This topic is often perceived as something unworthy of interest.

When writing about the limits of teaching, it is worth mentioning one that the teacher must not cross. It is important to ensure that classes on non-scientific theories do not become an opportunity to promote them and, at the same time, undermine the achievements of medicine. This is, of course, unacceptable within the walls of a medical university. It is also particularly important when the students are at the beginning of their professional careers.

The formula of the classes and its evolution

I began teaching the first elective course on this subject at the Medical University of Gdańsk in the 2013/2014 academic year. This was entitled "The wrong turn of medical science. From humoral pathology to homeopathy". I taught it for the following fields of study: medicine, dentistry, pharmacy and medical analytics. In this first formula, most of the time was taken up by my lecture with a multimedia presentation, and the scope of the subject matter covered quite distant history.

Chronologically, I ended with the 19th century and homeopathy, and, if time allowed, I presented the evolution of eugenics. Later, I offered the course to other fields of study, including

physiotherapy, electroradiology, and doctoral students from three faculties. At the same time, there were nine courses with the same title.

As a person with a degree in education and experience in teaching academic classes, I began to consider expanding the subject matter and changing the teaching methods. I decided to expand the topics covered to include contemporary issues. Why? It can be observed that many of the non-scientific theories currently in use draw their sources from alleged tradition or references to history. Their proponents base their arguments on what seems to be a logical assumption: if something is old, it is proven, so it must work.

Following the change in subject matter, I decided to change the title of the course from the 2020/2021 academic year. Data for the period from 2022 is included in the table below.

Course title	Field of study	Number of hours and meeting format
Academic year 2022/2023		
Ancient and contemporary non-scientific methods of treatment	First Doctoral School	15 (seminars)
Ancient and modern non-scientific methods of treatment. From misunderstandings to conspiracy theories	Medicine and dentistry	15 (seminars)
Ancient and modern non-scientific methods of treatment. From misunderstandings to conspiracy theories	Pharmacy	5 (lectures), 10 (seminars)
Academic year 2023/2024		
Ancient and modern non-scientific methods of treatment. From misunderstandings to conspiracy theories	Pharmacy	5 (lectures), 10 (seminars)
Unconventional medicine yesterday and today. From misunderstandings to conspiracy theories	Medical analytics	5 (lectures), 10 (seminars)
Academic year 2024/2025		
Ancient and modern non-scientific methods of treatment. From misunderstandings to conspiracy theories	Pharmacy	5 (lectures), 10 (seminars)
Ancient and contemporary non-scientific methods of treatment. From misunderstandings to conspiracy theories	Medicine and dentistry	15 (seminars)

Course topics and teaching methods

As for the topics covered, the fifteen teaching hours are divided into five meetings. The first class is devoted to organisational matters, including the outlining the topics, and there is a lecture on the development of medical ideas, past and present paradigms in health sciences. Its aim is to define the framework that medicine had and currently has as a science.

The next three meetings are devoted to presentations prepared by students, although initially the format of lectures with discussion prevailed. There are eight such presentations at each of the three meetings. Participants pick them in advance. So far, we have managed to collect about 80 ideas and theories that have no basis in today's science and which, to a greater or lesser extent, refer to the past, which, given the subject matter of the course, must find an appropriate place in the presentation. However, participants can refer to the contemporary situation and are eager to do so.

The formula of presenting issues by the participants did not work out entirely. With approximately 24 people and 15 teaching hours, students often became bored, especially during less interesting presentations. This was not difficult to “achieve”, as most facultative subjects at the Medical University of Gdańsk are taught in the late afternoon.

In search of ways to engage students, an evaluation coupon was introduced. From now on, each participant awards points to the presentations they have listened to. It has a very simple structure:

Ancient and modern non-scientific methods of treatment – 10 January 2025	
Presentation	Points
Aromatherapy	
Bioresonance	
Lithotherapy	
Iridology	
Orthopaedics	
Reflexology	
Doman Method	

NOTE: we assign points from 1 to 7, but none of the values can be repeated.

Many people studying medical subjects are empathetic and do not want to hurt anyone with their assessment, so in order to differentiate between them, each score can only be used once. To ensure comfort, the assessment is anonymous. To maintain this, participants are asked to award themselves the maximum number of points. During the next meeting, the presentation that received the highest number of points from the audience is awarded. There is also a discussion of why this particular presentation was found to be the most interesting.

The other positions in ranking are not announced publicly, but those who are interested in their result may receive this information. This presentation format not only adds variety to the classes, but is also a method of improving one of the social competences, namely: public speaking. At the same time, it is possible to obtain information on how the presentation was received. Recently, participants have been able to propose their own topics, agreed in advance with the teacher.

In addition, participants are encouraged to engage in the class by being required to ask at least one question during each meeting about a selected presentation, immediately after it has been delivered. The presenter has the opportunity to answer immediately or to look up the answer later and share it with the audience.

As for the discussion, the exchange of ideas after the presentation often develops without the teacher's interference, and in fact, the teacher is only needed to start the discussion, give the floor to the person asking the questions, and conclude the discussion.

However, there are situations where presentations or discussions tend to undermine the status of scientific medicine or allegedly confirm unscientific theories. In such exceptional situations, the attitude of the person conducting the class is very important.

To summarise this part, it is important to emphasise the high level of content presented by medical students. A critical attitude is also important. Most of the knowledge presented comes from internet searches: databases of scientific articles, websites of people promoting unscientific theories, and social media.

The last class is a moderated discussion. Participants receive questions in advance and during the meeting they share their opinions, often referring to the material presented during the lecture and presentation. Here are some examples of topics for discussion from the 2024/2025 academic year:

1. Where does society's interest in non-scientific theories about health and disease come from?
2. Are we currently observing an increase in interest in non-scientific medicine, non-scientific theories, etc.?
3. How does the presence of non-scientific knowledge affect society?
4. What forms of communication do people who promote non-scientific theories about health and disease prefer? What motivates them?
5. Are there any ways to counteract the spread of non-scientific theories?
6. What did you gain from attending this course?

The course so far has shown that the boundaries of traditional teaching methods, such as lectures, presentations, discussions and partner dialogue, can often be crossed, and that different formats can be mixed. Within this subject, it is easy to turn the lecture into a basis for discussion. At the same time, there is a didactic intervention in the world of students' beliefs. This takes place while listening to the information provided by the lecturer, during research carried out in preparation for presentations or during discussions in class.

As a side note, I would like to mention that the course I teach is not the only one at the Medical University of Gdańsk that addresses the issue of misinformation in medicine.

Opinions of course participants

What conclusions can be drawn from the classes conducted for various medical programmes? In answering this question, I will not use the results of a survey conducted among students, but rather subjective opinions based on discussions or listening to the views of participants.

First of all, what is striking is the considerable interest in various non–scientific ideas and theories in this group. It is worth emphasising that this is not a situation where someone is a supporter of these ideas but simply guided by curiosity. This is justified by additional opinions included in the teaching survey completed later. These are enthusiastic comments, so I would not like to quote them here. I will only point out that, for example, in the 2024/2025 academic year, eight people completed the survey in the pharmacy programme, i.e. 1/3 of the participants, with an average of 100%. Six positive comments were also attached. The highest number of questionnaires for a single subject and field of study was completed in the 2022/2023 academic year. Fifteen out of 24 enrolled students did so, seven of whom shared additional positive opinions, often expressing the need to acquire such knowledge.

So, there is interest and a desire to acquire such knowledge, but what do participants think about the problem of non–scientific ideas themselves? First of all, they are surprised by their multitude and have not encountered most of them.

I found about 80 with historical connotations, and these are certainly not all of them. The issue raised during the classes is their high availability. Many people in the city of Gdańsk (Poland) are involved in bioresonance, which is, after all, a popular idea, but there are just as many places offering, for example, ear candling, a treatment that is equally pointless and supposedly derived from Native American traditions. Not only I but also the participants of the class checked this by preparing presentations: almost every non–scientific method, supposedly healing, can be used in the Tri–City area (north of Poland metropolis). For example, it is easy to find people promoting sylotherapy, i.e. therapeutic hugging of trees, or offering to hold USB cables in your hands, connected to a computer running a programme that is a remedy for destroying cancer cells. The latter example, found by one of the course participants, is difficult to comment on.

There have been cases where participants have called, pretending to be potential clients, and asked for details about the alleged therapy, thus obtaining information from the source of the problem. However, after listening to all the presentations, several groups came to the conclusion that Wrzeszcz (district of the city of Gdańsk) is a centre for offering various non–medical therapies.

It is not surprising that people at the beginning of their professional careers want to know how much it costs and whether it is possible to make money from it. Ichthyotherapy, i.e. removing dead skin from the feet or hands with the help of sucking barbel fish, costs from PLN 200 upwards, a bioresonance session costs around PLN 500, and the same amount is charged for using the aforementioned USB cables for 15 minutes.

Therefore, misinformation in medicine is not only a scientific problem, but also a profitable business. It is easy to calculate that dealing with this properly can bring in as much money as a well–paid medical professional. It is not uncommon for students to point out that people who are graduates of medical faculties, and even those with doctorates, are involved in this.

The authors of the presentation also point to another source of profit. This is the creation of various types of courses, preferably online, or even something they call schools. Training in lithotherapy, or how to treat with stones, costs around PLN 1,000. In cosmoenergy, on the other hand, a whole hierarchy system has been devised, supposedly supported by tradition and history, and advancing to the next levels obviously costs money.

During the classes, attention is also paid to ethical issues, including historical aspects. After all, ethics has been one of the most important components of medicine since at least the time of Hippocrates. The discussion concerns, among other things, the extent to which patients should be forced to use the achievements of scientific medicine in today's world, and to what extent it should be their choice. In this case, there are radical cases, such as persuading the parents of a terminally ill child to abandon medical treatment in favour of something unscientific.

Conclusions

At the end of this text, I would like to pose a fundamental question: to what extent can we say that misinformation in medicine is a recent phenomenon, and to what extent is it a problem rooted in the past?

I am inclined to believe that the problem has existed for a long time, but has only recently been noticed by the scientific world.

If we assume that various non-scientific movements will remain with us, it is reasonable to consider whether the knowledge acquired during medical studies should also include misinformation and knowledge about various non-scientific theories, in line with the statement: to defeat the enemy, you must first know them. This should no longer be in the form of elective classes, but compulsory ones. For now, the enemies of scientific medicine are doing well and occupying new fields. One of them is veterinary medicine and recommending bioresonance for animals.

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